Research Article

Investigating Periodontal Indicators of Patients After Implant Prosthesis Placement in Patients with Multiple Sclerosis in Ilam

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Abstract

Background: Periodontal inflammation is one of the most common infectious diseases related to the mouth worldwide.

Objectives: This study was conducted with the aim of determining periodontal indicators of MS patients after implant placement.

Methods: This case-control study was conducted in the group of patients who visited private and public dental clinics in Ilam city for implant placement. In this study, after obtaining informed consent from the patients, their demographic information was recorded, and then the research and clinical examinations were started by the periodontist specialist. Periodontitis was diagnosed using clinical examination and questionnaire. After collecting the desired indicators, the data was entered into SPSS software version 16, and data analysis was done using independent t-test, ANOVA, and regression.

Results: Results showed that 41.7% of the patients in the case group, 20% in control group 1, and 6.7% in control group 2 had symptoms of periodontitis. In the case group, a significant relationship was observed between education status and smoking with periodontitis, such that in patients with education below diploma and a history of smoking, the rate of periodontitis was higher than in other patients ($P < 0.05$).

Conclusions: The prevalence of periodontitis in multiple sclerosis (MS) patients who visited dental clinics for implants was reported to be high. For this reason, it is recommended to carry out preventive and therapeutic protocols in this field more carefully.

Keywords: Periodontitis, Multiple Sclerosis, Prevalence, Prostheses and Implants, Dental Implantation

1. Background

Poor oral and dental hygiene is one of the most important health-related problems and concerns, caused by a lack of health literacy related to oral and dental health, improper diet, lack of access or limited access to health facilities, and smoking. This disease can lead to pain, loss of teeth, lack of proper communication, and reduced self-confidence due to lack of teeth, impairment of self-driving ability, and depression (1-5). Periodontal inflammation is one of the most common infectious diseases related to the mouth worldwide. Thus, its prevalence in 2017 is estimated to be around 796 million people (6). Periodontal disease is an inflammatory disease of tooth-supporting tissues

caused by certain microorganisms and leads to progressive destruction of the periodontal ligament (7, 8). This disease is associated with other diseases such as cardiovascular diseases, diabetes, respiratory infections, and adverse pregnancy outcomes (9, 10). The clinical symptoms of periodontitis include swelling and redness of the gums, bleeding and discharge of pus from the gums, pocket formation, resorption of the gums and alveolar bone, and if these symptoms are present, the patient's quality of life changes (11-13). Having periodontitis affects the patient's mental health, quality of life, and mental image of their body. It also causes economic pressure and care pressure on the patient, such that oral diseases like tooth decay and periodontitis are the fourth cause of imposing high costs on countries, and if not prevented, will result in

many economic consequences for the patient and society (14-16).

The first step to treat periodontitis is non-surgical treatment. In non-surgical treatment, the aim is to eliminate the etiological factors, which, by targeting the etiological factor and reducing the inflammation, reduces the depth of the pocket, reduces gingival inflammation, and reduces the level of clinical adhesion (17). Considering the complications that this disease will leave behind, the best measure is prevention. To prevent periodontitis, personal hygiene, especially oral hygiene, including regular brushing and flossing, regular toothbrush replacement, and regular and accurate care based on the professional principles of oral hygiene, are essential (18, 19). Prevention of a disease is related to several factors, including age, health literacy, geographic region, type of disease, and the presence of predisposing factors, including the presence of underlying diseases in a person. One of the underlying diseases that cause many complications in patients is multiple sclerosis (MS). Multiple sclerosis is known as an autoimmune disease that damages the central nervous system (20-23). In the study by Rokaya et al., 107 patients were included in the study, with a mean follow-up of 7.22 years. According to the findings, there was a difference between the clinical peri-implant and periodontal soft tissue status, which could be due to the initial healing process (24). Also, a review study by Iacono et al. showed that factors affecting the development of peri-implant and periodontitis include diabetes, smoking, and inflammatory responses (25). According to the results of the aforementioned studies, implant placement can be subject to risks, including periodontal indicators (26-28).

2. Objectives

Considering the prevalence of MS disease and its complications, it is necessary to prioritize the health of these patients, especially their oral and dental health (29). For this reason, this study was conducted with the aim of determining periodontal indicators of MS patients after implant placement.

3. Methods

This case-control study was conducted in the group of patients who visited private and public dental clinics in Ilam city for implant placement. Patients were divided into three groups: Control 1 (patients without MS and referred for implant placement), control 2 (patients with MS and not referred for implant placement), and case group (patients with MS and referred for implant placement). The diagnosis of MS

was based on the opinion of a neurologist along with the presence of clinical evidence in the field of MS, including clinical records and MRI findings. Patients with a history of pregnancy or breastfeeding, a history of periodontal treatment in the past 6 months, patients who were suffering from another chronic disease in addition to MS, or who were suffering from periodontal disease at the beginning of their visit, were excluded from the study. In this study, after obtaining informed consent from the patients, their demographic information, including age, gender, marital status, income, and smoking, was recorded. Then research and clinical examinations were started by a periodontist specialist. The desired indicators for the examination were consistent with the indicators required for periodontal diagnosis, which were performed in accordance with previously published sources (30-33). The aforementioned indicators were checked by a dentist at the beginning of the study, and the absence of periodontitis in the patients was ensured. Then, the periodontal screening score (PESS) tool was used to check periodontitis 6 months after implant placement. Periodontal screening score has several questions, the score of which is between 0 - 13, and if the score is less than 5, it means no periodontitis, and if the score is higher or equal to 5, it means the diagnosis of periodontitis (30-32).

Maintaining confidentiality of patient information, not charging patients for the study, and obtaining written informed consent to participate in the study were ethical criteria in the research. After collecting the desired indicators, the data was entered into SPSS software version 16, and data analysis was performed using descriptive and analytical statistics at a significance level of less than 5 percent.

4. Results

In this study, which had case and control groups, 12 patients were in case group 1, 15 patients were in control group 1, and 15 patients were in control group 2. A total of 42 patients were included in the study. According to the findings, no significant difference was observed between the demographic characteristics of the patients in the studied groups (Table 1).

The results showed that 41.7% of the patients in the case group, 20% in control group 1, and 6.7% in control group 2 had symptoms of periodontitis (Table 2).

In the case group, a significant relationship was observed between education status and smoking with periodontitis. Specifically, patients with education below a diploma and a history of smoking had a higher rate of periodontitis than other patients (Table 3).

Table 1. Comparison of Demographic Characteristics of Patients with Multiple Sclerosis in Case and Control Groups [a, b]

Variables	Case (N = 12)	Control 1 (N = 15)	Control 2 (N = 15)	P-Value
Age, mean ± SD	37.5 ± 1.95	37 ± 0.92	37.46 ± 3.04	0.66
Gender				0.75
Male	4 (33.3)	4 (26.7)	6 (40)	
Female	8 (66.7)	11 (73.3)	9 (60)	
Education				0.84
Less than a diploma	7 (58.3)	7 (46.7)	8 (53.3)	
Diploma and above	5 (41.7)	8 (53.3)	7 (46.7)	
Place of living				0.87
City	6 (50)	6 (40)	7 (46.7)	
Village	6 (50)	9 (60)	8 (53.3)	
Smoking				0.89
Yes	2 (16.7)	3 (20)	2 (13.3)	
No	10 (83.3)	12 (80)	13 (86.7)	

[a] Values are presented as No. (%) unless otherwise indicated.

[b] Case: MS patient with implant; control 1: MS patient without implant; control 2: General patient with implant.

Table 2. Comparison of Mean ± SD of Periodontitis Score in Case and Control Group Patients After 6 Months [a, b]

Variable	Case	Control 1	Control 2	P-Value, F
PESS Score				0.09, 2.56
< 5	7 (58.3)	12 (80)	14 (93.3)	
≥ 5	5 (41.7)	3 (20)	1 (6.7)	
Mean ± SD	1.41 ± 0.51	1.2 ± 0.41	1.06 ± 0.25	

Abbreviation: PESS, periodontal screening score.

[a] Values are presented as No. (%) unless otherwise indicated.

[b] Case: MS patient with implant; control 1: MS patient without implant; control 2: General patient with implant.

5. Discussion

In recent years, the relationship between periodontitis and public health has received special attention. In fact, in addition to periodontitis being more common in chronic patients, periodontitis can also be effective in other chronic diseases. Considering that the prevalence of this disease varies according to age, sex, geographical region, and type of underlying disease (33-35), this study was conducted with the aim of assessing the prevalence of periodontitis in patients with MS. Results showed that periodontitis was more common in people with low education and a history of smoking. In a review study conducted by Robitaille et al., it was shown that periodontal disease decreased with decreasing tobacco use, which is consistent with the results of this study (28). Also, in a review study by Leite et al., which reviewed 14 articles, it was shown that smoking can increase the risk of periodontitis by about

85% (risk ratio = 1.85) (36). The results of the above studies are consistent with the results of this study. Regarding the relationship between periodontal disease and educational status, a study by Gundala and Chava showed that the rate of periodontal disease decreases with increasing education, which is consistent with the results of this study (37). According to the findings, 5 (41.7%) of the 12 patients with MS who were referred for implant placement had symptoms of periodontitis 6 months after visiting the dentist and placing the implant. In the meta-analysis study by Tsimpiris et al., which examined the results of 3 observational studies with a sample size of 3376 people, it showed that periodontitis was more common in patients with MS than in healthy individuals (38). Results showed that the prevalence of periodontitis in people with underlying disease (case group 1) was reported as 20%. In the study by Poorkazemi et al. (Iran) in the group of cancer patients, it was shown that 37 out of 40 patients with colorectal cancer and 18 out of 23 patients with stomach

Table 3. Comparison of the Obtained Score of the Periodontal Screening Score According to the Demographic Characteristics of the Patients in the Case Group

Variables	Mean ± SD	Total
Gender		6.58 ± 3.94
Male	9.5 ± 4.5	
Female	5.12 ± 2.9	
P-value	> 0.05	
Education		6.58 ± 3.94
Less than a diploma	8.28 ± 4.42	
Diploma and above	4.2 ± 1.09	
P-value	< 0.05	
Place of living		6.58 ± 3.94
City	6.5 ± 3.67	
Village	6.66 ± 4.54	
P-value		
Smoking		6.58 ± 3.94
Yes	11.00 ± 1.41	
No	5.7 ± 3.68	
P-value	< 0.05	

cancer had periodontitis (39). Also, in the study by Jalili Sadrabad et al. (Iran) in the group of patients with psoriasis, the rate was reported as 80% (40).

According to the findings, the prevalence of periodontitis was reported to be 6.7% in patients who did not have an underlying disease (case group 2). In the study by Jaumet et al. in the group of general-population adults, the prevalence of periodontitis was reported as 19.6% (41). In the study by Zaitsu et al. (42), in the study by Silva-Junior et al. (Brazil) in the group of people aged 20 - 64 years, 107 out of 141 people were investigated (43). In the study by Aimetti et al. (Italy), the prevalence of severe periodontitis was 34.94%, and the prevalence of moderate periodontitis was 40.78% (44). The findings of this study are consistent with the findings of other studies on the prevalence and importance of periodontitis, but the prevalence reported in this study was much lower than in other studies. One reason for this is the small sample size of this study, which was 15 people. In the field of periodontitis prevalence, various meta-analysis studies have been conducted, which are referred to. In the meta-analysis study by Trindade et al., in 55 articles published in 17 countries, the prevalence of periodontitis was reported as 61.6% (45). In another study, in 114 reviewed articles, the prevalence of apical periodontitis was reported as 52% (38). In the meta-analysis study by Janakiram et al. in India, in 30 articles, the prevalence of severe periodontitis is 19%, and the prevalence of mild to moderate periodontitis is 26.2% (46). The results of the studies are consistent with the results of this study that periodontitis has been reported in patients with MS.

One of the strengths of this study is its attention to oral health, especially implant placement in patients with MS. On the other hand, one of the weaknesses of this study is the small sample size; it would be better to use a larger sample size in future studies.

5.1. Conclusions

The prevalence of periodontitis in MS patients who visited dental clinics for implants was reported to be high. For this reason, it is recommended to carry out preventive and therapeutic protocols in this field more carefully.

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Footnotes

Authors' Contribution: M. R. and F. F. conceived the study, performed data analysis, collected data, interpreted the results, and designed the study. They also wrote and edited the manuscript.

Conflict of Interests Statement: The authors declared no conflicts of interest.

Data Availability: The dataset presented in this study is available upon request from the corresponding author during submission or after publication.

Ethical Approval: The Ethics Committee of Ilam University of Medical Sciences, Ilam, Iran, approved the study (code: IR.MEDILAM.REC.1402.043).

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